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Cross-national comparison of humor categories: France and Germany*

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Abstract

The present study examines the cross-national stability of a factor-analytically derived taxonomy of jokes and cartoons. The comparison is based on a humor test aimed at measuring funniness and aversiveness of incongruity-resolution, nonsense, and sexual humor. Funniness and degree of controversiality of these humor categories were compared in France and Germany, and it was determined whether conservatism and intolerance of ambiguity are potent predictors of appreciation of these humor categories in France, as they have been in prior German studies. A sample of 69 male and 70 female French students responded to French translations of the humor test (Test 3 WD [3 Humor-Dimension], Ruch and Hehl 1985) as well as to two questionnaires measuring conservatism and intolerance of ambiguity. Their results were compared with those of a German sample of 59 male and 56 female students.

The results showed that the taxonomy derived from German and Austrian samples can be applied to French samples as well; the factor structures were very similar both at the level of the factors themselves and at the level of individual jokes and cartoons. Furthermore, comparable rank orders of funniness of jokes and cartoons were obtained for both samples. However, only the sexual humor category yielded stable controversiality across the two samples. Finally, the personality traits of conservatism and intolerance of ambiguity were predictive of appreciation of the humor categories in France, as they were in prior studies in Germany and Austria.

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Introduction

One major limitation of contemporary humor research is that little cross-cultural research designed to produce a taxonomy of humor exists. As a consequence, communication between researchers is impaired. Research conducted by investigators in different countries cannot be compared, making accumulation of knowledge difficult. If, for example, the results of a Greek investigation show that "females like nonsense humor more than males," it is not clear how to replicate the study in the USA or Asia. It would be up to the intuition of the researcher to determine what jokes and cartoons should be selected as being representative of "nonsense." However, the state of the art is even worse than this; it is generally not possible to compare the results of researchers in the same country or even the results of one investigator in different studies, since they typically use different jokes in different studies.

The perceived need for a taxonomy of humor may have been weakened by an implicit agreement with the Freudian (1905) categorization of jokes as sexual, aggressive, or "harmless." Although Freudian theory has been heavily criticized by contemporary humor researchers, Freud's taxonomy of wit is used in many studies. In applying this trilogy, it is intuitively assumed that these humor types are homogeneous categories and comparable across different studies in which sexual, aggressive, and harmless jokes are used. This belief has been demonstrated to be wrong since factor-analytic results (aimed at establishing a taxonomy of humor) show that so-called "aggressive" humor does not form a single category but is distributed across different categories (Ruch 1981, 1984). When asked to explain a joke, some subjects do not see the aggressive elements but refer to its originality and surprisingness (for instance, Bariaud 1983; Ruch 1981). Others see aggressive elements where no aggressive content is intended (Ruch 1981). Therefore, it is not clear what has been investigated when an "aggressive humor" category has been used.

There are also severe problems with the sexual humor category. Different researchers may get different results in doing the same study even though both of them are investigating "sexual humor." While a sexual humor factor consistently appears in taxonomy studies, it is questionable whether "sexual" constitutes a homogeneous category. We propose a distinction between at least three subgroups of sexual humor. This suggestion is based on several criteria. First, in sexual humor it is not only the salient content that contributes to funniness but also the structure

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in which this content is embedded. We have identified the incongruity-resolution scheme (Bariaud 1983; Shultz 1972; Suls 1972) as one major structure underlying the processing of humor, and nonsense (partly or completely unresolved incongruity) as the other. We have consistently observed that sexual jokes and cartoons frequently have a relatively high second loading on the structural factors (Ruch 1981, 1984; Ruch and Hehl 1986b). Thus, on the basis of factor-analytic results we distinguish between sexual humor based on an incongruity-resolution structure or on a nonsense structure and relatively "pure" sexual humor. The category "pure sexual humor" is composed of sexual jokes and (mostly) cartoons which have a very low loading on the structural factors.

The second criterion for this distinction between types of sexual humor is the verification by rational analysis of the structure by experts. Such analyses confirm the different structural bases of the sexual jokes and show that in the last category the sexual content is so overtly present that it overpowers the effects of structure. Finally, we have found that the three subcategories of sexual humor show different correlations with personality traits. For example, nonsense sexual jokes and pure nonsense jokes uniformly correlate with the same personality traits (for instance, sensation seeking), but incongruity-resolution sexual jokes do not. On the other hand, only the sexual jokes based on the incongruity-resolution structure correlate with the predictors of the general incongruity-resolution humor category (for examples, conservatism, intolerance of ambiguity); nonsense sexual humor does not.

Finally, there are problems with the homogeneity of the category "harmless" or "non-tendentious" humor, too (for a discussion see Bariaud 1983). They can either be based on the incongruity-resolution structure or on the nonsense structure, and depending on that very different results can be obtained.

In order to increase our understanding of humor, a frame of reference has to be established which allows for a comparison of different humor studies. This common frame of reference is a taxonomy of humor. We must identify the number and types of homogeneous humor categories that may be distinguished and develop lists of jokes and cartoons which are typical representatives of these categories. The criterion for establishing a category must be that stimuli within a category are more similar to each other than to stimuli within other categories; the stimuli within a category must be relatively interchangeable. In psychological humor research, two jokes would be interchangeable if subjects react to both

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jokes in the same way; those who smile and find one joke funny should react similarly to another in that category, and those who judge one joke to be not funny and fail to smile or laugh at it should do the same in response to another joke in the same category. Generally speaking, the criterion for including two jokes in the same category is that they correlate highly with each other across a large set of subjects. Drawing a representative sample of jokes and cartoons would allow identification of the number and nature of psychologically meaningful humor categories. However, using, for example, 100 jokes would result in 4,950 correlation coefficients describing the relations among each pair out of the 100 jokes. Classification of these data would be a time-consuming endeavor. Therefore, statistical tools like cluster analysis, factor analysis, or multidimensional scaling have to be used, which allow us to explain this mass of correlations by obtaining a small number of dimensions or categories. With the help of these and related methods, a taxonomy of humor stimuli can be established empirically. If humor researchers in different cultures were to use these technologies and exchange and compare their results, we would soon arrive at a common frame of reference which would allow us to integrate research conducted in different cultures.

The present article constitutes a first step in this direction. It investigates whether the same humor categories can be derived from a set of jokes and cartoons in two different countries, France and Germany. Specifically, it is determined whether the three humor factors found in German studies can be duplicated in France. Furthermore, it has been tested whether several other aspects of humor are comparable across the two nations, such as the mean funniness and controversiality (that is, how heterogeneous the responses are) of these humor categories and whether the same type of personalities appreciate these humor categories in France and in Germany.

A taxonomy of jokes and cartoons

The basis for the comparison is a humor test aimed at measuring the three basic factors of incongruity-resolution, nonsense, and sexual humor. These three factors are the result of a set of factor analyses of jokes and cartoons in several German and Austrian studies using samples differing with regard to sex, age, occupation, health status, and other variables. These three humor factors have been shown to provide an exhaustive

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taxonomy in classifying jokes and cartoons at a general level. Two of these dimensions refer to the structure of humor and one to a dominant content.

The most powerful structure factor (incongruity-resolution humor) consists of jokes and cartoons in which the surprising incongruity can be completely resolved. There is general agreement on the existence of this two-stage structure in the process of perceiving and understanding jokes and cartoons (Bariaud 1983; Shultz 1972; Suls 1972). In nonsense humor, the other consistently emerging structural factor, there is generally a surprising or incongruous punchline, exactly as in incongruity-resolution humor. However, "... the punchline may 1) provide no resolution at all, 2) provide a partial resolution (leaving an essential part of the incongruity unresolved), or 3) actually create new absurdities or incongruities" (McGhee, Ruch, and Hehl 1990). In nonsense humor the resolution information gives the appearance of making sense out of incongruities without actually doing so (see also Rothbart and Pien 1977). As mentioned above, sexual humor is the third category, and this is the only content-dominated humor category which has consistently appeared.

Factor analysis has also been used to investigate the dimensionality of the responses to humor (Ruch 1981). Appreciation of humor is defined by two nearly orthogonal components: "funniness" and "aversiveness." Funniness represents the degree of positive response to humor, that is, exhilaration, smiling, and laughter. Aversiveness covers the possible negative responses to humor, like indignation, embarrassment, or boredom. Maximum appreciation of jokes and cartoons consists of high funniness and low aversiveness, while minimal appreciation occurs if the joke is not considered funny but is found aversive. However, a joke can also be considered not funny but be far from being aversive; or it can make one laugh although there are certain annoying aspects (for instance, one can consider the punchline original or clever but dislike the content of the joke).

Construction of the humor test

The 3 WD ("3 Humor-Dimension") humor test was designed to assess funniness and aversiveness of jokes and cartoons in these three humor categories. There are three versions of the test (3 WD-K, 3 WD-A, and 3 WD-B). They contain 50 (Form K) or 35 (Forms A and B) jokes and

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cartoons which are rated on "funniness" and "aversiveness" using two seven-point scales. Forms A and B are parallel tests; they are used together as a long form (with 60 items scored) when reliable measurement is needed, or as parallel versions before and after an intervention when the effects of a treatment have to be evaluated. Forms A and B do not overlap, but the purest items of them form the 3 WD-K, which is a short form. The first five items of each form are used for "warming up" and are not scored. Six scores can be derived: three for funniness of incongruity-resolution, nonsense, and sexual humor (that is, $INC\text{-}RES_f$, NON_f, and SEX_f) and three for their aversiveness (that is, $INC\text{-}RES_a$, NON_a, and SEX_a). These six scores describe an individual's sense of humor at a general level. Other indices have been derived from these scores and validated in several studies (Ruch 1988; Ruch and Hehl 1988; Ruch, McGhee, and Hehl 1990). For example, a structure preference index was obtained by subtracting funniness of nonsense from funniness of incongruity-resolution. Similarily, the funniness and aversiveness scores of a humor type can be combined to form a more general appreciation score.

There were several stages in the construction of the 3 WD humor test. The initial sample of jokes and cartoons comprised 600 items, of which 100 were selected on a rational basis for the first study (Ruch 1981). It attempted to represent different contents and structures in this pool. These 100 jokes and cartoons were given to 156 subjects who were asked to rate them on a seven-point scale ranging from "not at all funny" to "very funny," and to mark whether the cartoons and jokes were already known or not. The pool was subsequently reduced to 48 on the basis of the results of a factor analysis; widely-known jokes were deleted. This pool of jokes and cartoons was tested using a representative sample of 110 Austrian adults who rated each of the jokes and cartoons on seven-point scales according to five criteria (degree of funniness, aversiveness, exhilaration, laughter, and liking). A three-mode factor analysis was performed and yielded the three orthogonal humor stimulus factors described above and the two humor response factors of funniness and aversiveness. Therefore, in subsequent studies only the funniness and aversiveness scales were used.

A new large pool of humor items was assembled which consisted of jokes and cartoons which were expected to be either good representatives of the three categories or be very different from them in order to test whether additional dimensions needed to be extracted. A total of 120 jokes or cartoons were included in this new experimental humor test

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consisting of the 48 from the previous study and 72 drawn randomly from the new pool. These 120 items were distributed among six test booklets with 23 items each; the first three were "warm-up" items and were not considered in the scoring. The separation into six tests allowed administration on different occasions, thereby preventing overstimulation and boredom. This version was administered to four German and Austrian samples containing altogether approximately 700 subjects (Ruch 1984) who were tested individually in order to avoid social influences.

The same three humor categories emerged again in these four samples, so it was not necessary to expand the 3 WD test to include new factors. Pairwise comparison of the factor loadings for these samples revealed a highly replicable structure, even when comparing the German and Austrian samples. We gave the booklets to all subjects in the same order in two of the samples, and factor analyses revealed two additional factors for these samples. On factor four (a "warm-up" factor) the loadings of the items consistently decreased from the first to approximately the tenth joke presented, and the loadings were not different from zero from item 15 onwards. The fifth ("end of test") factor was loaded only by the last 10 items, and the loadings increased consistently between items 110 and 120. However, these items had their main loading on one of the three factors on which they were supposed to load. The size of the loadings on the structure and content factors increased in a fashion parallel to the decrease of the loadings on factors four and five. These factors were considered to be artifacts of the test administration and were not included in the taxonomy. However, this finding led us to increase the number of practice items to five since the loadings were negligible from there on.

The 3 WD humor test was constructed on the basis of the data obtained for these four samples. Those jokes and cartoons which showed a stable factor pattern across the four samples were selected for the test. Furthermore, in order to obtain parallel forms, an attempt was made to pair jokes and cartoons matched for content, mean funniness, loading pattern, and style (verbal or pictorial, with or without caption). Then one of the pair was used in Form A and the other in Form B.

The three forms of the humor test have now been used in numerous studies in Germany and Austria. The internal consistency of the scales varies between .85 and .95, mostly exceeding .90. There is a high degree of equivalence between Forms A and B; the parallel test reliability of the six scales has ranged from .87 to .95 (Ruch and Hehl 1987). An abridged form of the 3 WD test was administered in an adult life span study

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comprising more than 4000 subjects (Ruch, McGhee, and Hehl 1990) and showed that the two structure factors apply equally well to subjects across the whole age range tested (15 to 60 years), since basic statistics (internal consistency, parallel test reliability, and factor structure) did not differ as a function of the age of subjects.

Personality correlates of appreciation of humor

The 3 WD not only assesses an individual's humor along six basic dimensions; it also allows one to predict information about certain personality traits and attitudes. This inference is based on a set of studies which successfully related appreciation of the three humor categories to personality variables (see McGhee, Ruch, and Hehl 1990 for a review). In the present study, the links between humor appreciation and the personality variables of conservatism and intolerance of ambiguity were tested.

Conservatism and intolerance of ambiguity generally refer to individual differences in the need for contact with structured, stable, unambiguous forms of stimulation and the tendency to avoid uncertain, complex, unpredictable, ambiguous stimuli and situations. In humor this tendency is reflected in the need for resolution of incongruity and dissatisfaction with unsolvable or partly solvable incongruities. The various relationships between appreciation of humor and conservatism and intolerance of ambiguity are outlined elsewhere in more detail (Hehl and Ruch 1990; McGhee, Ruch, and Hehl 1990; Ruch 1981, 1984; Ruch and Hehl 1983, 1986b); only the main hypotheses are presented here.

It was hypothesized that conservatives would judge incongruity-resolution humor to be funnier and less aversive than would liberals. Furthermore, they were expected to find nonsense more aversive than liberals. These predictions are based on the fact that a full resolution of incongruities is possible in incongruity-resolution humor, whereas a residue of uncertainty is always left in nonsense humor. The reduction of uncertainty should be more pleasurable for conservatives than for liberals, and the remaining incongruity should be experienced more negatively by them. Several studies confirm that conservatism is associated with higher funniness ratings of resolvable joke types (incongruity-resolution humor and sexual humor based on the incongruity-resolution structure) and with higher aversiveness ratings of nonsense humor (Hehl and Ruch 1985,

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1990; Joachim 1986; Rath 1983; Ruch 1981, 1984; Ruch and Hehl 1985, 1986b). These results were obtained using four different conservatism scales, and they were found in both the German and Austrian samples (Ruch and Hehl 1986a). Furthermore, there are highly parallel age differences in conservatism on one hand and funniness of incongruity-resolution humor on the other (Ruch, McGhee, and Hehl 1990). Similarily, it was predicted and found that subjects with high levels of intolerance of ambiguity tend to enjoy incongruity-resolution based humor and find nonsense humor aversive (Ruch and Hehl 1983, 1985, 1986b). Thus, the second aim of the present study is to confirm that these two personality variables are also predictive of humor appreciation in a French sample.

Method

The French sample

The sample was comprised of 69 male and 70 female non-psychology students at the University of Paris who volunteered and participated in this study. Their ages were between 18 and 30 years, with 85% of the subjects between 18 and 22 years.

Measures of conservatism and intolerance of ambiguity

The items used to measure conservatism were taken from the *Public Opinion Inventory* (POI; Eysenck 1976), which consists of 88 items measuring three attitude dimensions: radicalism-conservatism, capitalism-socialism, and toughmindedness-tendermindedness. Only the 27 conservatism items considered suitable for a French sample were included in the questionnaire. These items were rated on a five-point rating scale according to degree of agreement/disagreement. A factor analysis using the data of the present sample showed that these items could be grouped into "right-wing extremism" (five items have loadings $>.40$), "law and order attitude" (six items $>.40$), and "economic liberalism" (four items $>.40$). These three factors explained 25.4% of the total variance. The items measuring intolerance of ambiguity were taken from two questionnaires measuring this trait (Eysenck 1954; Nigniewitzky 1955). The suitable 19 items were given to subjects in a yes/no answer format. A factor analysis yielded two factors explaining 19.5% of the variance. They were

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labeled "uncertainty avoidance" and "authoritarianism" (five items > .40 each).

Translation of the humor test (Forms A and B)

The 70 items of Forms A and B were initially translated by a native speaker of German who had lived in France for several years. She was aided by a native French speaker. Then the jokes and cartoons were translated back into German, and the translation was compared with the original. Several changes were made during this procedure. The resulting changes in the French translations were then checked in Paris by the French authors. After agreement was reached on the successful translation of the cartoons and jokes, a pilot study with 21 students between 18 and 30 years of age was completed. The word-play in five items partly lost its funny meaning in the French versions, so these items were eliminated. The remaining 65 items were rated according to degree of funniness and aversiveness using seven-point rating scales, and the subjects provided a free verbal evaluation of the jokes and cartoons. Nine items were deleted because of low response variance or frequent negative evaluation. Finally, 56 of the 70 jokes and cartoons were judged to be transferable to the French culture. They were presented to the subjects in two booklets (Forms A and B) with 28 items each, employing the standard instructions.

The German sample

In order to obtain a comparable German sample, the data of 59 male and 56 female non-psychology students used in a previous study (Ruch and Hehl 1986b) were reanalyzed. The subjects' ages ranged from 18 to 32 years with a mean of 22.6 yr and a standard deviation of 3.0 yr. These subjects answered all 70 jokes and cartoons of Forms A and B of the humor test. Those 14 items which were not used in the French version were excluded from further analyses. A principal component factor analysis was calculated using the remaining 56 items. The screen test clearly showed that three factors are important, although eigenvalues in excess of unity were found for 15 factors. Three factors were extracted and rotated using the varimax routine. These turned out to be clearly interpretable as incongruity-resolution, nonsense, and sexual humor. This pattern of loadings was regarded as a reference or basis of comparison with the French sample.

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Results

Factor analysis of the humor test in the French sample

The funniness ratings of the 56 jokes and cartoons were intercorrelated and subjected to a principal axis factoring with iterated communalities. Three factors were extracted and rotated using the Varimax routine. The factors were easily identified as incongruity-resolution, nonsense, and sexual humor. Taking a loading of .40 as a criterion, 20 items loaded on the incongruity-resolution factor (highest loading: .69), 15 on nonsense (highest loading: .64), and 19 on sexual humor (highest loading: .73). Forty-eight of the 56 items had their highest loading on the expected factor, and eight had a higher loading on a different factor. However, in each of these eight cases the loading on the expected factor was high, and the loading on the other factor was only slightly (on average .04) higher. Furthermore, in each of these eight cases, the joke or cartoon had this second loading in the German sample as well; the only difference was that this second loading exceeds the size of the main loading in the French sample.

Comparison of the factor structure of the German and French samples

Two methods were used to estimate the cross-national stability of the three humor factors. First, the method of factor comparison introduced by Kaiser, Hunka, and Bianchini (1971) was applied, which provides an index of factor similarity (cosines between corresponding factors) ranging from 0 (no similarity at all) to 1.00 (perfect agreement) for each pair of factors. This method was used by Eysenck and Eysenck (1982) to test the universality of certain personality factors across 25 nations. They suggested interpreting cosines between .98 and 1.00 as indicating *essentially identical* factor structure and coefficients between .95 and .98 as *similar*. Coefficients between .90 and .95 are regarded as *fairly similar*, and .80 is considered to be the lower bound of acceptable similarity. The resulting cosines for the incongruity-resolution (.98), nonsense (.98), and sexual (.99) humor factors suggest that each of the three humor factors can be classified as essentially identical in the two countries.

Second, Tucker's Congruence Coefficient was used to examine the strength of the relationship between the corresponding profiles of the

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factor loadings in the German and French samples. These coefficients are usually lower than the cosines. However, the resulting coefficients were sufficiently high for each of the three humor factors before (.88, .90, and .93) and after (.88, .91, and .93) the rotation of the French matrix which established maximum overlap between the factors.

Finally, the factor profiles of individual jokes in the two spaces (loadings in the German and the rotated French matrix) were compared for each joke separately. The resulting Congruence Coefficients (cosines between the locations of a joke in the two spaces) were between .54 and 1.00 with an average value of .91. One quarter (14 items) of the jokes and cartoons had indices which indicated *essentially identical* factor patterns (between .98 and 1.00); another quarter of jokes and cartoons were *similar* (between .95 to .98), and 11 were *fairly similar* (between .90 to .95). Another nine items were still acceptable, and only eight of the 56 jokes and cartoons were below .80. Thus, the high stability of the factor pattern can be found on the level of individual items, too. This is especially noteworthy for the sexual humor category, since it confirms that the structural basis of the sexual jokes and cartoons can also be replicated.

The high stability of the factor structure in the two countries is also reflected by the total variance explained in the French (38%) and German (39%) sample. The proportion of variance explained by the rotated factors is nearly identical for the German matrix (INC-RES, 14.30%; NON, 10.25%; and SEX, 14.54%) and the French matrix before (13.88%, 10.24%, 13.92%) and after the rotation (14.31%, 9.15%, and 14.58%).

Replication of personality correlates of humor in the French sample

Another component of cross-national stability was investigated next. It was determined whether conservatism and intolerance of ambiguity show comparable patterns of correlations with appreciation of the three humor categories in the two countries. The correlations between subjects' factor scores on the five personality factors and funniness of the three humor categories are presented in Table 1.

Table 1 shows that funniness of incongruity-resolution humor is positively correlated with both components of intolerance of ambiguity, uncertainty avoidance and authoritarianism, and also with the law-and-order attitude component of conservatism. Hence it is confirmed that conservatism and intolerance of ambiguity are significant predictors of

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Table 1. *Correlations between funniness of the three humor categories and personality factors in the French sample*

	$INC\text{-}RES_f$	NON_f	SEX_f
Intolerance of ambiguity			
Uncertainty avoidance	.23**	.03	.10
Authoritarianism	.26**	−.25**	.19*
Conservatism			
Right-wing extremism	−.04	−.22*	.26**
Law-and-order	.32***	−.13	.04
Economic liberalism	.00	−.08	.15

*P<0.05; **P<.01; ***P<.001.

funniness of jokes and cartoons with solvable incongruities in France as well. Funniness of nonsense shows a quite different pattern, since the signs of the correlations are mostly negative. Authoritarian subjects and subjects with extreme right-wing attitudes rate nonsense as low in funniness. They apparently do not enjoy the punchlines of nonsense cartoons which provide no resolution at all, provide only a partial resolution, or actually create new absurdities or incongruities. Whereas the dislike of the remaining unsolvable incongruity is usually reflected in the conservatives' *enhanced aversiveness* ratings, in the present study it is also expressed in *lowered funniness* ratings of the extremely conservative persons. Their "black-and-white" style of thinking prevents enjoyment of the playful but improbable, strange, incongruent, ambiguous, odd, absurd elements involved in nonsense humor. However, these subjects consider sexual jokes and cartoons funnier than others do; authoritarianism and right-wing extremism is significantly positively correlated with funniness of sexual humor. Economic liberalism correlates positively (and significantly in a one-tailed test) with funniness of sexual humor, replicating the positive correlation between funniness of sexual humor and capitalistic attitudes found by Ruch and Hehl (1986a). Finally, the two sets of predictors are interrelated themselves; authoritarianism is significantly positively correlated with right-wing extremism ($r_{(137)}=.33$; $P<.001$), law-and-order attitudes ($r_{(137)}=.53$; $P<.001$), and economic liberalism ($r_{(137)}=.34$; $P<.001$). The two predictors of funniness of incongruity-resolution humor, uncertainty avoidance and law-and-order attitudes, are positively intercorrelated ($r_{(137)}=.26$; $P<.01$).

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Cross-national stability of mean funniness and controversiality

Means and standard deviations for the 56 individual jokes and cartoons were computed separately for the two samples. The means can be used to compare the *average funniness* of a given joke or cartoon in the two samples. A joke or cartoon is *controversial* if it is perceived as very funny by some persons and not at all funny by others. It is not controversial if subjects tend to agree on its funniness, independent of *how* funny it is. The standard deviation of the 56 items serves as an index of the degree of controversiality of a cartoon or joke.

In order to test the degree of agreement among the two samples on funniness and controversiality, the respective indices for the French and German sample were intercorrelated; that is, the correlation between the standard deviations of the 56 items in France and Germany was calculated as mean funniness scores of 56 items across the two samples. These coefficients were computed for all 56 humor items and for the subgroups of 21 incongruity-resolution, 17 nonsense, and 18 sexual items separately.

Generally, those jokes considered funny by the German subjects were also considered funny by the French subjects ($r_{(54)} = .47$; $P < .001$). This relationship was extremely high for sexual humor ($r_{(16)} = .77$; $P < .001$), high for nonsense humor ($r_{(15)} = .67$; $P < .01$, and still significant for incongruity-resolution humor ($r_{(19)} = .45$; $P < .05$). Thus, the two samples tended to agree on which jokes and cartoons are funnier than others.

With respect to controversiality, the cross-national stability was significant for sexual jokes ($r_{(16)} = .50$; $P < .05$) but not for the incongruity-resolution ($r_{(19)} = .10$; n.s.) and nonsense ($r_{(15)} = .09$; n.s.) humor categories and for the whole pool of humor items ($r_{(54)} = .07$; n.s.). Thus, sexual jokes and cartoons with large variances in Germany also had large variances in France, and those jokes and cartoons to which the German sample responded more homogeneously were also more homogeneous in the French sample. This finding is noteworthy, since several jokes and cartoons had been eliminated using this criterion.

Differences in mean funniness in the French and German samples

In order to investigate whether the samples differ with regard to appreciation of these humor types or not, two different analyses were undertaken. First, the *total scores* in the three humor categories of the German ($n =$

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116) and French ($n = 139$) samples were tested for difference (that is, total funniness scores for INC-RES, NON, and SEX humor were derived for each subject by adding the scores of the items of a category). This comparison is justified, since the factors can be regarded as nearly identical in the two nations. The French and German total scores, as well as the results of the *t*-tests, are presented in Table 2. Since standard deviations were available for the German sample only ($INC\text{-}RES_f$: 22.68, NON_f: 18.60, SEX_f: 20.05), the tests are based only on this variance. However, since the French sample has lower standard deviations at the item level (French: 1.75, German: 1.88), the F-value is a conservative estimation. Second, *t*-tests for independent samples were computed to determine the difference between the samples at the level of individual jokes and cartoons (see Table 3).

Table 2. *Funniness of the humor categories in the French and German samples*

Humor category	German mean	French mean	T-Value
$INC\text{-}RES_f$	49.33	39.37	3.49***
NON_f	46.46	30.23	6.93***
SEX_f	36.14	36.86	−.29 n.s.

***P < .001.

Table 3. *Comparison of mean funniness of single jokes and cartoons in the French and German samples*

		Level of significance				
	total	n.s.	.10	.05	.01	.001
$INC\text{-}RES_f$						
French > German	1	1	0	0	0	0
German > French	20	8	3	1	1	7
NON_f						
French > German	1	1	0	0	0	0
German > French	16	1	1	1	0	12
SEX_f						
French > German	10	6	1	3	0	0
German > French	8	5	1	1	0	1

Note
French > German = Items with a higher mean in the French sample.
German > French = Items with a higher mean in the German sample.
n.s. = difference not significant.

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Table 2 shows that the German sample judged incongruity-resolution humor and nonsense humor significantly funnier than the French subjects; that is, the samples differ with respect to appreciation of the structure component in humor. At the level of individual items the German sample rated 9 of the 21 incongruity-resolution items and 14 of the 17 nonsense cartoons as significantly funnier than did the French sample (see Table 3).

There was no difference in funniness of the general sexual humor category (see Table 2); however, there are grounds for assuming that the French sample shows a higher appreciation of sexual content than the German sample, which is neutralized by their lower appreciation of the structure component. Rational analysis as well as inspection of the factor loadings suggest that the three sexual jokes and cartoons preferred by the French sample are content-dominated whereas in the two sexual items preferred by the German sample the structure contributes substantially to funniness (suggesting that the German sample not necessarily preferred the specific *content* of that joke). Furthermore, the only items of the incongruity-resolution and nonsense categories which are preferred by the French sample are cartoons with slight sexual connotations.

In order to test whether the generally higher German means were due to an artifact, it was first evaluated whether the differences depend on the quality of the translation. If the observed differences were caused by a reduction in funniness due to the translation, then differences would occur mainly with the purely verbal jokes; there might be some differences in the captioned cartoons, but no differences should occur for noncaptioned cartoons. In fact, significant differences were obtained for 11 of the 21 verbal jokes (52%), 9 of the 23 captioned cartoons (39%), and 8 of 12 cartoons without caption (67%). Thus, there were even more frequent significant differences in cases where no translation was necessary. This rules out the possibility that the quality of the translation was responsible for the results.

Discussion

The most important finding of the present study is that the humor taxonomy developed in the German-speaking countries can be applied to France as well. The cosines between the factor axes of the corresponding factors in the two nations suggest that the humor categories incongruity-resolution, nonsense, and sexual can be regarded as essentially

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identical in the two countries. Surprisingly, the coefficients for these factors are just as high as those in the comparison of German and Austrian data (Ruch and Hehl 1984). In this earlier study of the cross-national stability of humor factors the 120-item version of the humor test was given to two German samples and one Austrian sample of young adults. Comparison of the two German varimax rotated factor loadings with the Austrian matrix yielded high cross-national stability for incongruity-resolution (.99, .99), nonsense (.98, .97), and sexual (.97, .97). Hence it can be assumed that the French and Austrian results would also converge. Whereas the comparability of findings for the Austrian and German samples is not surprising, because of the overlap of culture and language in the two countries, the high cross-national stability for the French and German samples is noteworthy. These results do not imply that additional humor categories would not appear in France (or in any other country) if highly different humor material were included. Rather, we are claiming that the intrinsic structure in this set of jokes and cartoons is essentially identical in the three European countries investigated. Empirical categorization of these jokes and cartoons consistently leads to the same three homogeneous clusters.

Most of the coefficients for single items (which are less stable and reliable) were also very high. Furthermore, the two samples showed high agreement on which jokes and cartoons are funny and which are not. The rank-orders of preference were highest for sexual humor and lowest (but still significant) for incongruity-resolution humor. The degree of controversiality of sexual jokes was also highly stable; jokes and cartoons controversial in Germany also produced heterogeneous responses in France. No such stability existed for the incongruity-resolution and nonsense humor categories. Taking these results together we can regard the three humor factors as practically invariant across the two nations. The results suggest that it is possible to translate jokes and cartoons without changing their intrinsic structure. Most importantly, there were no apparent differences between captionless cartoons and verbal jokes with respect to factor structure.

While Bariaud's (1983) extensive rational analysis already confirmed the existence of the incongruity-resolution structure in French cartoons, the existence of the nonsense category in French humor has received little attention. The present findings show that nonsense humor also forms a homogeneous dimension in France; that is, French subjects are sensitive to the distinction between punchlines with completely resolvable incon-

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gruities and punchlines which either provide no resolution at all or provide only a partial resolution or actually create new absurdities or incongruities. There is nothing surprising about the confirmation of a sexual humor category, since this category would probably be found in any culture (for an analysis of French sexual humor see Baudin, Feuerhahn, and Bariaud, 1986). However, the finding that a structural basis for sexual jokes and cartoons exists and that it can be replicated across two cultures is new. These results suggest that researchers have to be careful to distinguish between pure sexual jokes and sexual jokes based on incongruity-resolution or nonsense structure in empirical studies; or if they wish to use only one sexual humor category, they should ensure that each of the three subtypes are represented equally well. Otherwise their findings would be biased in an unknown way.

There is also evidence for the validity of these factors in American humor. In a recent study (for a discussion and critique of older studies see Ruch 1981; Wilson 1979), Herzog and Larwin (1988), apparently unaware of the existence of the humor taxonomy studied here, seem to replicate two of the three humor categories. They had subjects rate 64 black-and-white captioned cartoons varying in content (for example, sexual, aggressive, political, marriage, feminism) according to several criteria. Among these was a five-point funniness scale. A nonmetric factor analysis was used to analyze the data and suggested extraction of between four and six factors, but only four humor categories were interpretable in each solution. The humor factor containing the largest number of cartoons was the sexual category, which also included a few scatological or simply vulgar but nonsexual cartoons. The sexual facor usually emerges first in our studies as well. Toughminded subjects enjoy sexual jokes (Ruch and Hehl 1988), but they also enjoy other "tough" contents more than tenderminded subjects do; therefore, the finding that the sexual humor category also contains "vulgar" or "scatological" cartoons was not unexpected. Herzog and Larwin (1988) report that their second category is more difficult to characterize because the cartoons dealt with a variety of themes, the only common denominator appearing to be the basic incongruity of the situation. They suggest that this category appears to be about cognitive processes rather than thematic content and named it "incongruity." Inspection of the structure of the items of this category by one of the present authors (W.R.) suggests that they are based exclusively on the incongruity-resolution structure (as are their sexual cartoons). However, the best empirical test of the identity would have been if Herzog

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and Larwin had included markers (that is, typical representatives) of our categories in their pool. Their third category also dealt with a variety of themes and was labeled "social issues," and their last small category contained "marriage–family" themes, again based exclusively on the incongruity-resolution structure. On the whole, our nonsense category is not represented in their item pool, although some of the "social issues" cartoons might show loadings on a nonsense factor (which also deals with a variety of themes).

The Herzog and Larwin study replicates several other findings of ours. For example, only positive loadings appear within a dimension, which suggests that there are no bipolar humor categories (for instance, simple vs. complex, aggressive vs. harmless). Most interestingly, no category of aggressive/hostile humor appears, although Herzog and Larwin were careful to include enough potential representatives of such humor in the pool. Aggressive or hostile jokes and cartoons were also included in our humor tests but never formed a separate factor (Ruch 1981, 1984).

A further aspect of cross-national stability of humor categories was also confirmed; appreciation of the different humor categories in France was predicted by the same personality traits as in Germany. Thus, conservatism and intolerance of ambiguity were again positively predictive of funniness of incongruity-resolution humor and sexual humor, and correlated negatively with funniness of nonsense. Hence, as a further result, the present study enlarges the list of predictors of humor appreciation. The positive correlation between intolerance of ambiguity, conservatism, and funniness of incongruity-resolution humor is based on the components "uncertainty avoidance," "authoritarianism," and "law-and-order attitudes." As in other studies, the correlation between conservatism and funniness of nonsense is negative and weak. However, the present study suggests that components like "authoritarianism" and "extreme right-wing attitudes" are also significant negative predictors of funniness of nonsense.

Finally, it was confirmed that considering sexual jokes and cartoons funny is not a sign of liberal attitudes. On the contrary, sexual jokes and cartoons were appreciated by authoritarian subjects with extreme right-wing attitudes. This replicates the findings of Ruch and Hehl (1986b), who showed that sexual humor (especially incongruity-resolution based sexual humor and pure sexual humor) is appreciated most by tough-minded conservatives, since in Eysenck's (1954) two-dimensional model of social attitudes authoritarian personalities can be described as tough-

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minded conservatives. Toughminded *liberals*, however, appreciated sexual humor based on the *nonsense* structure (Ruch and Hehl 1986b). This would suggest that the correlation between authoritarianism and extreme right-wing attitudes and appreciation of sexual humor found in the present study is based on the sexual jokes and cartoons with solvable incongruities only, and that the few items of nonsense sexual humor included are uncorrelated, or (like the pure nonsense category) even negatively correlated with both authoritarianism and extreme right-wing attitudes. This should be investigated in further studies.

Thus, the main correlates of appreciation of humor were replicated in France. Conservatism was also a potent predictor of appreciation of humor in Austria (Rath 1983; Ruch 1981). The size of the correlations obtained here is smaller than for the German and Austrian samples. This may be due to the fact that no standard instruments validated in France could be used for the personality variables; all the questionnaires were applied in France for the first time.

These proofs of cross-national stability are necessary prerequisites for a study on national differences in sense of humor. Since criteria for the cross-cultural applicability of the present humor test (3 WD) have been met, it is now possible to test whether a difference in national sense of humor exists between the two countries. Thus, the 3 WD could be given to comparable representative samples of both nations in order to evaluate whether they differ with respect to appreciation of these three basic humor categories or not. The present study has not accomplished this goal, since the two samples used are hardly representative of French and German students. The samples consisted entirely of university students and are comparable only with respect to age, sex, and partly also for major subject, but we do not know whether the two samples differ with respect to other variables (for instance, social class, etc.) or not. For a cross-national comparison of sense of humor, it would be desirable to carefully sample a broad range of age levels, professions, and geographical locations in the two countries. The latter is especially important since rural people are generally more conservative (Ruch 1981).

Fortunately, the differences in the pilot study were not restricted to verbal jokes or captioned cartoons. Therefore, any differences obtained cannot be attributed to the fact that German humor was translated into French. Furthermore, it cannot be argued that the French subjects were confronted with nothing but genuine German humor since only a few of the cartoons used in the study have a German origin. In fact, several of

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them were created by French cartoonists. Cartoons and jokes are distributed around the world with the help of international magazines; hence the potential national bias is low. The same jokes are often used in many countries with only slight modification (most often only the names are changed; for example, "Dupont" is replaced by "Müller" or "Smith"). In order to rule out any alternative interpretation, a comparison between two countries could be based on the humor of both countries (given that these items are first tested for their factor pureness). Cross-national differences in humor should be obtainable with French jokes and cartoons translated into German as well as with German jokes and cartoons translated into French. Ideally, the translation should be done by a team of linguists, psychologists, and maybe also professional (or skilled amateur) humorists in both countries. The latter should search for ways to optimize funniness. Sometimes a linguistically correct translation is not the funniest one, and a skilled bilingual humorist would know how to improve it. Furthermore, the psychologist should take care that the intended meaning of a joke or cartoon is made explicit before translation. We discovered that the translator (like any other person) sometimes did not fully understand the "agreed-upon" meaning of the joke or had a very personalized understanding of it. We became aware of this by having more than one person translate the jokes and cartoons. Finally, a sample of bilingual subjects could be used in order to verify that the quality of humor is the same in both languages.

Given the lack of representativeness of the samples used here, the results of the present study should only be used to derive hypotheses for future studies. The French and German samples clearly differed with respect to the type of humor they appreciated most, and the results suggest that the humor of the two nations might differ with respect to the relative importance of structure and content. The German sample found the structure-dominated humor categories of incongruity-resolution and nonsense funnier, whereas the French sample showed preference for jokes and cartoons characterized by the dominant sexual content. Generally speaking, it appears that the German sample derived more pleasure than the French sample from the cognitive elements (originality, surprisingness, solution of incongruity) and less from the affective elements (the content). However, as stated above, representative samples of subjects and humor of both countries are required to verify this or any related hypothesis.

It can be concluded that the first attempt to test the cross-national

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stability of an empirically-derived humor taxonomy was successful. Thus, further studies along these lines should prove fruitful. Tests of cross-national stability should include attention not only to the factor pattern but also to mean funniness and controversiality and, most importantly, to the replication of the personality correlates of appreciation of the different humor categories. The pursuit of a humor taxonomy which is stable within and across different nations and which serves as a frame of reference for integrating different findings should be one of the first goals of humor researchers. We have already witnessed two decades of intensive research on rather complex questions without such basic issues like a taxonomy of humor stimuli having been resolved.

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Note

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